

REMARKS/ARGUMENTS

This response is made to the final Office Action dated July 24, 2007. No amendment is made in this response to the specification or claims. Presently, claims 1-12 remain in the application.

The claims of the application are rejected under 35 U.S.C. §102(b) and/or under 35 U.S.C. §103(a), citing Justman, U.S. Patent No. 4,280,742 as the sole or the primary reference. As will be set out in greater detail below, Applicant believes the present invention, as now claimed, patentably distinguishes over Justman '742, taken either alone or in combination with other references such as Jones, U.S. Patent No. 2,189,040.

Applicant's claimed invention is directed to an attachment device for a cutting tool that provides significant advantages over prior art cutting tools of the same type. As explained in the application, cutting tools of the type to which the present invention is directed, having inserts or attachments carrying cutting surfaces, are desirable since, usually, only the cutting surfaces are expended during a drilling operation, such as those being carried out for exploration or recovery of mineral deposits. The loads applied to the cutting surfaces are very substantial and a typical drilling operation requires the cutters to be replaced many times. Further, a typical cutting tool of the type to which the present invention is directed, has multiple cutting edges, as shown for example, in FIG. 1 of the application. The premise for a successful business operation, is that the relatively massive cutting tool is quickly and easily replenished with new cutting elements and returned to service as quickly as possible so as to prevent excessive down time.

Unfortunately, however, it has been found to be extremely difficult to remove the cutting elements, let alone in a timely fashion. It is generally preferred, in practical drilling operations, for example, that the replaceable cutting elements be secured in place on the cutting tool with reliable yet very strong fasteners. The fasteners of choice are threaded fasteners, in the form of bolts or screws which extend through the cutting elements and are received in the body of the cutting tool with a threaded engagement sufficient to support the cutting element. The cutting element partially projects beyond the cutting tool so as to come in contact with the ground or other material being operated upon, sufficiently so as to withstand very substantial forces applied to the cutting element. Given the fact that threaded fasteners are desirable for their inherent strength and reliability, successful business operations have come to rely on their use. However, extreme difficulty has been observed in attempting to remove the threaded fasteners after the cutting tool is recovered from a cutting operation in which very substantial applied loads have been applied to the cutting elements, and hence to the threaded fasteners. While there are industry standards for typical threaded fasteners with the relative dimensions and clearances between threaded mating members, cutting tools constructed according to these conventional standards have proved inadequate in that the threaded fasteners could not be removed from the cutting tools once applied loads had been applied to the cutting elements, and hence to the threaded fasteners holding those cutting elements to the cutting tool.

According to principles of the present invention, it has been found necessary to provide unconventional features of the mating threaded members. In addition to other features, claim 1 recites a plurality of threaded fasteners having a preselected diameter for securing a cutting element to a tool, with threaded apertures defined in a second surface of the tool that are threadingly engaged by the threaded fasteners. The claim also calls for an arm including walls that define through holes extending through the arm, to receive and

locate the threaded fasteners so as to threadingly engage with the tool, with the through holes having a diameter that is larger than the diameter of the threaded fasteners, such that there is a clearance between the walls and the threaded fasteners that minimizes sheer load applied by the arm to the threaded fasteners. Only with Applicant's claimed invention are threaded fasteners made readily removable from cutting tools that have been subjected to loads applied to cutting elements and hence threaded fasteners during a cutting operation.

Applicant's claimed features are neither shown nor suggested in Justman '742, which is directed to the relationship of dowel pin-nuts 47 disposed in sockets 43, 45, for a 90° rotation, as set out in column 4, lines 8 through 21 of Justman '742. The loose fit of Justman '742 is limited to this 90° rotation needed for assembly of Justman '742 to bring lugs on the nuts 47 into engagement with retaining flanges so as to hold the radial dowel pin against radial outward movement. Nowhere does Justman '742 mention details of the engagement, let alone any unusual clearance between cap screws 25 and nuts 47. Such clearance is suggested only in Applicant's claimed invention.

Claims 1 and 4-12 are rejected under 35 U.S.C. §102(b) as anticipated by Justman '742. For the reasons set forth above, it is respectfully asserted that Justman '742 does not anticipate Applicant's claimed invention calling, in part, for through holes having a diameter that is larger than the diameter of threaded fasteners such that there is a clearance between the walls forming the through holes and the threaded fasteners that minimize the sheer load applied to the threaded fasteners, as recited in Applicant's claim 1. As mentioned above, Justman '742 does not disclose this feature of Applicant's claimed invention. The loose fit of Justman '742 relates only to the engagement of the nuts and the tool body, and is entirely unrelated to threaded engagement with the nuts, as in Applicant's claimed invention. Claims 4-12 depend from claim 1 and incorporate the limitations thereof.

Therefore, in light of the above remarks, Applicant respectfully requests the Examiner to reconsider and withdraw the rejection of claims 1 and 4-12 under 35 U.S.C. §102(b). The rejection is believed to have been fully overcome.

Claims 2-4 are rejected under 35 U.S.C. §103(a) over a combination of Justman '742 in view of Jones '040. Jones is cited for an attachment device of a conical roller cutter used in a cutting tool. However, Jones '040 does nothing to cure the deficiencies of Justman '742. In Jones '040, cutting elements are supported by a shaft 8 having supporting blocks 9 and 10 at its opposite ends. The threaded ends 18 and 19 of shaft 8 engage nuts 20, 21 threaded onto the ends of the shaft. No details concerning the threaded engagement, let alone the clearance called for in Applicant's claimed invention, is shown or suggested in Jones '040, and thus the deficiencies of Justman '742 described above are not cured by combination with Jones '040. Accordingly, the rejection of claims 2-4 under 35 U.S.C. §103(a) is also believed to have been fully overcome.

It is respectfully submitted that claims 1-12, all the claims now present in the application, are allowable and an early allowance of the application is respectfully requested.

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The Examiner is requested to contact the undersigned if a discussion would be useful in advancing the prosecution of this application.

Respectfully submitted,

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By


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CERTIFICATE OF MAILING

I hereby certify that this Response and its attachments are being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450 on October 24, 2007.



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